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FINDING OF NO SIGNIFICANT IMPACT
TENNESSEE VALLEY AUTHORITY
TIMS FORD DAM FLOW MODIFICATION FOR HABITAT QUALITY IMPROVEMENTS FRANKLIN COUNTY, TENNESSEE

Proposed Action and Need

The temperature and flow rate of water releases from control structures are an important factor in determining the characteristics of aquatic habitat downstream. In 2004, TVA began a programmatic consultation under the *Endangered Species Act* with the U.S. Fish and Wildlife Service (USFWS) concerning routine operation and maintenance of TVA's dams. In 2006, USFWS issued its Biological Opinion. Selectively altering flow to improve aquatic habitat for federally listed aquatic species below Tims Ford Hydropower Dam (TFH) addresses commitments outlined in the Biological Opinion. Through an adaptive management approach, TVA is seeking to balance the goal of improving habitat for federally protected aquatic species (i.e., the boulder darter, shiny pigtoe pearlymussel, fine-rayed pigtoe, birdwing pearlymussel, Cumberland monkeyface, and cracking pearlymussel) downstream of TFH with the other program interests of flood protection, water supply, water quality, recreation, and power production.

Alternatives

TVA considered two alternatives, namely, the No Action Alternative and the Adaptive Management Alternative.

Alternative A – No Action Alternative. Under this alternative, TVA would continue to operate TFH under historic multi-use guidelines established when the project was completed in 1970. These operations would maximize power production through generation during high demand periods. Continuous minimum flows of at least 80 cubic feet per second (cfs) would continue to be met. No generation would occur on summer weekends in order to provide recreational opportunities downstream of TFH.

Maximizing power production would involve hydro generation that would continue to release high flows of cold water from the lower portion of the reservoir for intervals needed to maintain reservoir operating guidelines. The duration, timing, temperatures, and rate of these flows would continue to provide less than optimal conditions for sensitive aquatic species in the Elk River. When generating, TVA would continue to meet the established dissolved oxygen criterion of 6 mg/L through turbine air injection and oxygen injection. TVA would continue operating the dam to stay within the flood guide (e.g., in a flood situation, the large unit could be used around the clock to help evacuate water from the reservoir to maintain or restore the pool level of Tims Ford Reservoir within the floodguide). During drought conditions such as the conditions experienced in the summer of 2007, there could be lengthy periods of no generation, however, minimum flows would continue to be maintained for water quality, habitat, and water supply.

Alternative B – The Adaptive Management Alternative. Under this alternative, TVA would seek, through an adaptive management approach, to balance the goal of improving habitat for federally protected aquatic species (i.e., the boulder darter, shiny pigtoe pearlymussel, fine-rayed pigtoe, birdwing pearlymussel, Cumberland monkeyface, and cracking pearlymussel, as

well as two candidate species - the slabside pearlymussel and sheepnose) with other program interests such as flood protection, water supply, water quality, recreation, and power production.

As discussed in the Environmental Assessment (EA), this approach involves: 1) identification of desired future conditions; 2) initial implementation of measures to achieve those conditions; 3) long-term monitoring for results and potential ancillary impacts; 4) reporting of results, and discussion of those results among the Multi-Agency Working Group; and 5) refinement of implementation and monitoring (as needed and within the bounds of conditions described in the subject EA), to achieve the above noted balance of needs and desired conditions for aquatic habitat in the Elk River. Under this adaptive management strategy, TVA would implement changes at TFH and then monitor results. Monitoring information would be shared with the Multi-Agency Working Group. This group includes representatives from TVA, USFWS, Tennessee Wildlife Resources Agency (TWRA), and Alabama Department of Conservation and Natural Resources (ADCNR), and U.S. Geological Survey (USGS). Using an adaptive management approach, the Multi-Agency Working Group would assess operational changes and their effects. Should the original changes fail to achieve the desired results with respect to aquatic habitat, water quality, and biological conditions, or if they have unintended consequences, the Multi-Agency Working Group would recommend an approach that refines the original changes.

The desired future conditions for the Elk River below TFH (as described below) include water temperatures and flow conditions that more closely simulate a typical free-flowing stream in this part of the watershed. These conditions presumably would result in improved benthic habitat, population size, and distribution of the listed species. By spreading out the flow and providing more constant temperatures downstream, habitat conditions for sensitive aquatic species are be expected to improve. By modifying the method of water release and the duration, timing, and flow rate of releases, TVA proposes to warm the spring and summer tailwater temperature and lessen water level fluctuations year-round, especially at times (May - October) critical to the successful reproduction of the boulder darter. The focus of this proposal is to improve habitat conditions as far upstream as practical from Fayetteville. The Fayetteville area is presently the upper-most limit of the boulder darter in the Elk River. Changes in these segments are expected also to result in overall habitat improvements for sensitive aquatic species along the length of the Elk River from TFH (ERM 133) to its confluence with Wheeler Reservoir. TVA would continue to meet the established dissolved oxygen criterion of 6 mg/l.

Computer modeling of historic water year flows and temperatures on the Elk River below TFH was used to develop the Adaptive Management Alternative. This modeling indicates that from May through October, use of the large turbine at TFH may need to be limited to create water temperature ranges more suitable for the listed species. The initial operational conditions to be implemented from May through October include: spilling, sluicing and short periods of generation, adjusted by temperature monitoring data to meet temperature targets for the warm-water endangered species as well as the trout in the immediate tailwater reach below TFH; no change in the management of peaks and duration of floods; and operating TFH as in previous years from November through April. Only the distribution of the downstream flow would change. However, the hourly flow rates in the Elk River below TFH would tend to vary less over the course of the day. Lessened fluctuations in flow rates would also tend to favor the establishment of riparian vegetation, which is expected to reduce bank erosion.

Impacts Assessment

The EA addresses issues related to the following media categories: water quality (including water supply and erosion), aquatic ecology (including threatened and endangered species), cultural resources, and recreation.

Under the No Action Alternative, there would be no change in the operation of TFH. Accordingly, no change in resources would occur in TFH because conditions would remain the same.

Existing conditions and trends for fish and benthic communities, including listed mussel and fish species, in the Elk River downstream of TFH would not be anticipated to change significantly under the No Action Alternative. Unnatural temperature and flow conditions could continue throughout the spring, summer, and fall months. Although warm water fish and mussel communities have shown some improvement following establishment of minimum flows and aeration of tailwater releases, these improvements have not resulted in conditions that would support survival of many species in the river upstream of Fayetteville. Releases of cold water due to turbine generation continue to depress native fish and mussel populations even in the lower portion of the Elk River.

Implementation of the Adaptive Management Alternative would have no effects or negligible effects on terrestrial animals, terrestrial plants, cultural resources, natural areas, visual resources, and wetlands. Because the implementation of the action alternative includes limited use of the large hydro turbine between May and mid-October, the available recreation days for the Elk River below TFH would remain comparable to the No Action Alternative. If, however, within the adaptive management framework, the Adaptive Management Action Alternative were adjusted to be comprised solely of spilling and sluicing and no generation, the number of days available for float fishing would increase but the number of days available for wade fishing may decrease. Minor economic benefits could result from more frequent recreational visits to the Elk River below TFH. Modeling indicates that operational options within the Adaptive Management Alternative allow water temperatures in the upper Tims Ford tailwater to be maintained within a range that would continue to support survival and growth of trout.

One of the most visible short-term and cumulative effects with respect to water quality anticipated from implementation of the Adaptive Management Alternative would be decreased erosion along the Elk River due to less frequent use of the existing large hydro turbine. Implementation of the Adaptive Management Alternative would also reduce the amount of thermal alterations to aquatic habitat due to cold water discharges from TFH. Currently, 15.4 miles of the Elk River from TFH to the confluence with Beans Creek near the Moore, Lincoln, and Franklin County lines are listed on Tennessee's draft 303(d) list for thermal impairment, and the effects of this impairment can extend over the entire reach of the Elk River from TFH to the Wheeler Reservoir backwater.

Stabilization of flow and temperature regimes is expected to enable the subject-listed species to recover and their populations to increase. The extent of success of the action alternative over the next ten years could range from relatively minor increases to establishment of stable or expanded populations of these listed species.

Mitigation

Adoption of the preferred alternative, the Adaptive Management Alternative, will include the following commitments and mitigation measures:

1. TVA will monitor temperature in the tailwater (as described in Appendix C of the EA) to evaluate the impacts of operations. These data will be used to evaluate the effectiveness of implementing the Adaptive Management Alternative.

2. TVA will monitor physical and biological conditions (as described in Appendix C of the EA) in the tailwater to evaluate the impacts of operations. These data will be used to evaluate the effectiveness of implementing the Adaptive Management Alternative.

3. TVA, in cooperation with USFWS, USGS, TWRA, and ADCNR, will conduct surveys of the Elk River between TFH and Fayetteville to identify areas that contain suitable habitat for the reintroduction of the boulder darter and listed mussel species that occur in the Elk River.

4. TVA, in cooperation with USFWS, USGS, TWRA, and ADCNR, will monitor existing boulder darter populations in the Elk River to assess continued viability of these populations and document any increased reproductive success.

5. TVA will analyze the effectiveness of the implementation of the Adaptive Management Alternative and will revise the activities as necessary to support the five Aquatic Species Habitat Improvement Objectives.

6. This action would be an adaptive management process, and effectiveness in lessening impacts on threatened and endangered species and meeting the stated aquatic species habitat goals would determine future actions. If the operational changes described in this EA are determined to be ineffective in improving habitat conditions and lessening impacts on threatened and endangered species, TVA will analyze alternative actions that could meet these objectives.

7. TVA will organize annual meetings of the Multi-Agency Working Group to review improvements to listed aquatic species habitat on the Elk River. With the concurrence of the Multi-Agency Working Group, TVA could proceed with additional measures. Results of monitoring will be reported to USFWS, USGS, TWRA, and ADCNR yearly.

Public and Intergovernmental Review

TVA established a Multi-Agency Working Group consisting of representatives from the USFWS, the USGS, TWRA, the ADCNR, and TVA technical staff. Under the USFWS Biological Opinion, the Multi-Agency Working Group would evaluate the impacts of proposed operational changes at the Bear Creek dams, TFH, and Wilson Dam. The Multi-Agency Working Group met for the first time on March 22, 2007, and for the second time on February 20, 2008. That group will continue to meet to discuss results and provide recommendations for future refinements of the activities implemented to create the identified desired future conditions in the Elk River. The present EA and Finding of No Significant Impact covers only the activities associated with operations of TFH.

The draft version of this EA was issued for public and interagency review and comment on April 25, 2008. TWRA and two offices of the USFWS commented on the Draft EA during the review period. All comments received by the closing date for comments (June 10, 2008) are presented in Appendix A of the EA.

Conclusion and Findings

TVA has reviewed the subject EA and determined that the potential environmental consequences of the proposed action have been addressed. TVA concludes that the action alternative is not a major federal action significantly affecting the quality of the environment. Accordingly, preparation of an environmental impact statement is not required.

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Date Signed